

REMARKS

Applicant has cancelled claim 38. Claims 1-25, 32-36, 39 50 and 51 are pending while remaining claims 26-31, 37, 40-49 and 52-55 are withdrawn.

In the Office Action, the Examiner remarked that the IDS filed on August 27, 2004 cannot be located. Applicant will submit a copy of the IDS and cited reference as filed in a separate submission by mail so that the reference can be considered by the Examiner.

The Examiner objected to the drawing because they allegedly do not show the “plurality of regions include dimensions that are chirped”. Applicant respectfully traverses the objection. Applicant submits that FIG. 1 fully shows the feature claimed. Chirped region means that the distance (periodicity P) between the alternating nanostructures or regions varies. FIG. 1 denotes the period as P. Since FIG. 1 does not show whether the P between two nanostructures varies or is the same, applicant submits that FIG. 1 does show the regions as either having different P’s or the same P’s. According to the specification at paragraph 22, the P can be constant or varied. Accordingly, applicant submits that FIG. 1 fully shows the chirped feature as claimed in claim 25 and respectfully requests the Examiner to withdraw the objection to drawings.

The Examiner objected to claims 14-19 because there is no proper antecedent basis for the “first refractive index” or “second refractive index”. Applicant has amended, for clarity and to provide an antecedent basis only, claims 14, 16 and 17.

The Examiner rejected claims 1, 5-10, 12, 14-17, 32-33, 36, 38-39 and 50-51 under 35 U.S.C. Section 102(e) as being anticipated by Borrelli (US Patent No. 6813077). Applicant respectfully traverses the rejection.

Independent claim 1 has been amended to incorporate claim 38. Also, claim 1 has been further amended to recite that the device has a transmission extinction ratio of about 100 over the *entire* wavelength range of 390 nm to 1650 nm. Thus, claim 1 is directed to a broadband polarization dependent device that covers infrared, visible light and ultra violet light wavelength range.

The Examiner takes the position that Borrelli teaches a device whose transmission extinction ratio is greater than about 100 over the entire range of 390 nm to 1650 nm. Applicant respectfully disagrees. The Borrelli device is apparently a narrow band device that has either a fixed operating frequency or a narrowband infrared range only.

Empirically, it has been shown that the minimum operating wavelength for a particular grating device starts at about 3 times the grid's periodicity. For example, EXAMPLES 1 and 2 (cols. 5-6 of Borrelli) disclose the grid period to be 570 nm. That means the minimum operating wavelength starts at about 1710 nm which is in the infrared range. That means the Borrelli device does not work (i.e., does not have a transmission extinction ratio greater than about 100) in the visible or ultra violet wavelength range. As another example, EXAMPLE 3 (col. 7 of Borrelli) discloses the grid period to be 396 nm. That means the minimum operating wavelength starts at about 1188 nm which is also in the infrared range.

Consequently, the Borrelli device is only limited to a narrowband infrared operating wavelength range and cannot operate below that wavelength with a transmission extinction ratio greater than about 100.

Moreover, claim 1 now recites that the transmission extinction ratio is greater than about 100 over the *entire* wavelength range of 390 nm to 1650 nm. None of the cited references teach or suggest the relatively high transmission extinction ratio over such a wideband wavelength range.

For the similar reasons as discussed above, applicant submits that independent claim 50 is also patentable over Borrelli.

Dependent claims 5-10, 12, 14-17, 32-33, 36, 38-39 and 51 are also patentable by virtue of their dependency from independent claim 1 or 50.

The Examiner rejected claims 1-3, 5, 8-15, 17-20, 23 and 32-36 under 35 U.S.C. Section 102(b) as being anticipated by Perkins (US Patent No. 6288840). Applicant submits that this rejection is now moot due to incorporation of claim 38 (which has not been rejected under Perkins) into claim 1.

The Examiner rejected claims 1-3, 5, 8-10, 12, 14-15, 17-18, 20, 23-25, 32-34, 36, 38-39 and 50-51 under 35 U.S.C. Section 102(e) as being anticipated by Sales (US Patent Application Pub. No. 2004/0125449). Applicant respectfully traverses the rejection.

In Sales, the Examiner points to TABLE II as disclosing that the transmission extinction ratio is greater than 100 over the wavelength range of 390 nm to 1650 nm (see paragraph 73 in the Office Action). However, similar to the Borrelli device, the Sales device is also limited to a narrow band device that has either a fixed operating frequency or a narrowband infrared range only. That

means the Sales device does not work (i.e., does not have a transmission extinction ratio greater than about 100) in the visible or ultra violet wavelength range.


Consequently, Sales neither teaches nor suggests a polarization dependent device having a transmission extinction ratio of about 100 over the entire wavelength range of 390 nm to 1650 nm as claimed in claim 1 and claim 50.

Dependent claims 2-3, 5, 8-10, 12, 14-15, 17-18, 20, 23-25, 32-34, 36, 38-39 and 51 are also patentable by virtue of their dependency from independent claim 1 or 50.

The Examiner rejected claim 4 and 21 under 35 U.S.C. Section 103(a) as being obvious over Perkins and rejected claim 22 as being obvious over Perkins in view of Modern Optics by Guenther. Applicant submits that claims 4 and 21-22 are patentable by virtue of their dependency from independent claim 1.

Based upon the above amendments and remarks, Applicant respectfully requests reconsideration of this application and its earlier allowance. Should the Examiner feel that a telephone conference with Applicant's attorney would expedite the prosecution of this application, the Examiner is urged to contact him at the number indicated below.

Respectfully submitted,


Harry K. Ahn, Reg. No. 40,243
Attorney for Applicant

Reed Smith LLP
599 Lexington Avenue, 29th Floor
New York, NY 10022
Tel. (212) 521-5400